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COUNTRY Yugoslavia

SUBJECT Yugoslav Research in Pharmaceuticals/Need for  
Technical Know-How

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1. In the 1930's the statistics available showed that there were over 500,000 cases of syphilis in Central Bosnia alone. The beginning of Yugoslavia's effort to produce modern drugs was in the production of neoarsphenamine for the treatment of syphilis at a plant in Zagreb known as Kastle. The process for neoarsphenamine used at the Kastle plant was learned by a team of Yugoslav scientists who visited Toronto, Canada, and returned with the necessary technical know-how to set up the Kastle plant in the middle 1930's. As a result of the clinical use of neoarsphenamine, it is now a rare thing to see a new case of syphilis in Yugoslavia.

2. The Kastle plant is now known as the Pliva plant. The director of the Pliva plant, Dr Ratimir Siewert, was a student who worked and received his PhD under Prelog. Siewert is interested in the development of sulpha drugs and Vitamin C at the Pliva plant.

3. The other principal center for the production of pharmaceuticals in Yugoslavia is in the Galenika factory in the Zemun district of Belgrade, where penicillin is manufactured. The director of the Galenika factory is a medical doctor, a bacteriologist, G Tamburasev. This factory, incidentally the first in the world to produce penicillin, was brought from Canada and rebuilt in Belgrade through UNRRA sponsorship. However, this plant produces only amorphous penicillin, the kind which requires refrigeration. At present they cannot make crystalline penicillin in Yugoslavia, but plans are under way to buy a new factory for crystalline penicillin which will permit more general use of penicillin. Because the only crystalline penicillin available in Yugoslavia today is imported, it is in very short supply, very expensive, requires a prescription and can be used for emergency cases only.

4. The outstanding pharmacologist in Yugoslavia is Kreisimir Balenovic at the Faculty of Natural Sciences at the University of Zagreb.

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8. Since World War II the influence of German scientists has steadily decreased and there continue to be hard feelings against Germany, so that Yugoslavia is trying hard to encourage more correspondence with the US. This is not the natural source for foreign aid for Yugoslavia, for German know-how is much nearer. However, most of the young scientists now study English more than German and look to the US for future help in developing Yugoslavia's scientific resources.
9. The shortages for scientific research in Yugoslavia run from general chemicals to a sufficient number of dollars to permit scientists to publish in foreign journals, to receive foreign literature, and to belong to international scientific societies. The requirements for pharmaceuticals in Yugoslavia are peculiar to that country. For instance, we still have a very high incidence of typhus and typhoid. Most recent medical statistics, however, still show tuberculosis to be our most prevalent disease. [ ] medical statistics in Yugoslavia are quite accurate and that published data is conscientiously checked and crossed checked by the people of the bureau responsible for this work.
10. The specific problem in Yugoslavian production of pharmaceuticals, [ ] is in the production of Vitamin A. It is unfortunate that in Yugoslavia [ ] not have the necessary raw materials for producing [ ] own Vitamin A. [ ] however, Yugoslavia could not receive a license to produce Vitamin A by the Cotrell (sic) method of synthesis rather than by the tedious laboratory process of isolation. The world patents on this process are held by The Research Corporation which has licensed only three companies for the commercial production of Vitamin A. [ ] It will be virtually impossible for Yugoslavia to make the transition from the laboratory to a production scale process for the isolation of Vitamin A. This is a pity because the need for this vitamin in Yugoslavia is very great.
11. The situation with regard to raw materials for the production of Vitamin B in Yugoslavia is similar to that for Vitamin A. However, Vitamin B is relatively cheaper to buy and the economics of production in Yugoslavia are such that it is much cheaper to import Vitamin B than to try to produce it at home. The supply of Vitamin C is short in Yugoslavia, but [ ] have plenty of fish;

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so Vitamin D is no problem.

- 50X1 12. Insulin is another pharmaceutical badly needed and the production of insulin should be vigorously developed in Yugoslavia. [ ] an agricultural country and before the War had a good supply of healthy animals. However, it has always been very difficult to centralize the collection of the pancreas of slaughtered calves because the meat packing facilities of Yugoslavia are not centralized. After World War II, due to the animal shortage and the poor health of the animals remaining, the supply of insulin in Yugoslavia became critical. Not only were the supplies of animal pancreas insufficient, but [ ] were unable to collect the raw material because there was no good transportation and no refrigeration (about -5°C required). During the War Germany was faced with a similar problem but they were able to overcome it by the carefully controlled use of sodium sulphate as a preservative agent to stop fermentation immediately after slaughtering the animals. However, the secret know-how, though presumably passed by word of mouth by a German scientist to a Yugoslav at a scientific congress, has never been successfully applied in Yugoslavia. This need for technical know-how sums up Yugoslavia's problem and [ ] anxious to make [ ] plight known to the World Health Organization. Although the supply of insulin is presently very short in Yugoslavia, and [ ] have to import a great deal, there is no reason why, with proper development, [ ] could not become one of the principal exporters of this and other biologicals which have their basis in farm animal products.

- 50X1 13. [ ] have a shortage of trained production people in Yugoslavia. At Pliva the principal problems are a question of know-how not of well-trained graduate laboratory chemists. Perhaps 70% of the effort there is in pharmacology and the remaining 30% in pure chemistry research. The new Pliva laboratory itself is quite modern. In fact it is merely an imitation of the Squibb laboratory. [ ] not have enough instrumentation to support a production program [ ] estimate that [ ] supply only about 30% of Yugoslavia's present needs for the pharmaceuticals [ ] produce, although these needs would increase rapidly as the level of medical development in the country rises. [ ] certainly are not at the state where [ ] can use penicillin to improve the grade of [ ] hogs as is US practice.

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